

DETAILED ACTION

Response to Amendment

Receipt of the Amendment, filed on June 26, 2009, is acknowledged.

Cancellation of claims 2-4, 7-9 and 14-18 has been entered.

Claims 1, 5, 6, 10-13, 19 and 20 are pending in the instant application.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 5, 6, 10-13, 19 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant claims the determination of a range of thickness d_1 and d_2 to achieve a $L_{\text{background}}$ within a claimed percent value, however, how the thickness of d_1 and d_2 relates to the $L_{\text{background}}$, in order to achieve the claimed percentage, is not included in the claims or disclosed in the specification as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention. Moreover, the absent in the disclosure of a reasonable correlation between the claimed determination of thicknesses and the $L_{\text{background}}$ is considered evidence that at the time the application was filed, one skilled in the art would not have been taught how to make and/or use the full scope of the claimed invention without undue experimentation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 6, 10-13, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ko (US 6,876,018).

Regarding claim 1, Ko discloses an organic electronic device comprising a first electrode (34, Fig. 4; 52, Fig. 6), a second electrode (38, Fig. 4; 56, Fig. 6) and an organic active layer (36, Fig. 4; 60, Fig. 6), wherein the first electrode lies on a opposite side of the organic active layer, compared to the second electrode, and at least one layer selected from the first electrode, the second electrode, a hole-transport layer, an electron-transport layer and the organic active having a thickness adjusted to achieve reduced $L_{\text{background}}$ (Column 2, lines 28-38). Ko fails to explicitly state that the reduced $L_{\text{background}}$ is 30% or less of incident ambient light, however, Ko discloses the adjustment (i.e., optimization) of the thickness of the organic layer and/or the transparent electrode in order to achieve a desired reduced ambient-light reflection, thus providing for a low $L_{\text{background}}$ (Column 2, lines 28-38). Accordingly, it is considered within the capabilities of one skilled in the art to optimize prior art conditions (i.e., the corresponding layers thicknesses within the display panel) in order to obtain a result-effective value (i.e., a $L_{\text{background}}$ within the claimed values) as an obvious matter of design engineering in view of Ko's teachings. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to optimize the corresponding layers thicknesses within the display panel as taught by Ko to achieve a $L_{\text{background}}$ within the claimed values, since optimization of prior art conditions is considered within the capabilities of one skilled in the art.

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In regards to the stated equations to determine the range thicknesses d_1 and d_2 to achieve the claimed low $L_{\text{background}}$, patentability of the claimed device is based on its structural difference over prior art devices, limitations in regards to the determination of the thickness are considered as part of an intermediate process from which optimum values can be obtained and they are not considered germane to the issue of patentability of the device itself. Ko discloses an organic electronic device comprising the claimed layers and further acknowledges optimization of the thickness of these layers in order to reduce the $L_{\text{background}}$, accordingly, Ko is considered to meet the structural limitations of the claim.

Regarding claim 5, Ko discloses an organic electronic device comprising an organic active layer, and a first electrode having a side opposite the organic active layer, wherein the first electrode comprises a first electrode layer lying at the side opposite the organic active layer and the first electrode layer has a thickness adjusted to achieve reduced $L_{\text{background}}$ (Column 2, lines 28-38). Ko fails to explicitly state that the reduced $L_{\text{background}}$ is 30% or less of incident ambient light, however, Ko discloses the adjustment (i.e., the optimization) of the thickness of the organic layer and/or the transparent electrode in order to achieve a desired reduced ambient-light reflection, thus providing for a low $L_{\text{background}}$ (Column 2, lines 28-38). Accordingly, it is considered within the capabilities of one skilled in the art to optimize prior art conditions (i.e., the corresponding layers thicknesses within the display panel) in order to obtain a result-effective value (i.e., a $L_{\text{background}}$ within the claimed values) as an obvious matter of design engineering in view of Ko's teachings. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to optimize the corresponding layers thicknesses within the display panel as taught by Ko to achieve a $L_{\text{background}}$ within the claimed values, since optimization of prior art conditions is considered within the capabilities of one skilled in the art.

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In regards to the stated equations to determine the range thicknesses d_1 and d_2 to achieve the claimed low $L_{\text{background}}$, patentability of the claimed device is based on its structural difference over prior art devices, limitations in regards to the determination of the thickness are considered as part of an intermediate process from which optimum values can be obtained and they are not considered germane to the issue of patentability of the device itself. Ko discloses an organic electronic device comprising the claimed layers and further acknowledges optimization of the thickness of these layers in order to reduce the $L_{\text{background}}$, accordingly, Ko is considered to meet the structural limitations of the claim.

Regarding claim 6, Ko discloses an organic electronic device further comprising a second electrode (56, Fig. 6), wherein the organic active layer lies between the first electrode and the second electrode, a second electrode has a side opposite the organic active layer, and the second electrode comprises a second layer lying at the side opposite the organic active layer, and wherein the second electrode layer has a thickness adjusted to achieve reduced $L_{\text{background}}$ (Column 2, lines 28-38). Ko fails to explicitly state that the reduced $L_{\text{background}}$ is 30% or less of incident ambient light, however, Ko discloses the adjustment (i.e., the optimization) of the thickness the second transparent electrode in order to achieve a desired reduced ambient-light reflection, thus providing for a low $L_{\text{background}}$ (Column 2, lines 28-38). Accordingly, it is considered within the capabilities of one skilled in the art to optimize prior art conditions (i.e., the corresponding layers thicknesses within the display panel) in order to obtain a result-effective value (i.e., a $L_{\text{background}}$ within the claimed values) as an obvious matter of design engineering in view of Ko's teachings. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to optimize the corresponding layers thicknesses within the display panel as taught by Ko to achieve a $L_{\text{background}}$ within the claimed values, since optimization of prior art conditions is considered within the capabilities of one skilled in the art.

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Moreover, Ko discloses the second electrode made of ITO or IZO transparent material, accounting for a minimum ambient light reflection from the second electrode, thus, providing for a low $L_{\text{background}}$.

Regarding claim 10, Ko discloses an organic electronic device wherein an interfacial reflectivity is not greater than about 30 percent. The interfacial reflectivity is calculated as follow, given the refractive index of first electrode, ITO $n_x=1.95$, the refractive index of adjacent layer $n_y = 1.7$, the interfacial reflectivity being determined by $R = I_{\text{reflected}}/I_{\text{incident}} = [(n_x - n_y)/(n_x + n_y)]^2$, $R = 0.4\%$.

Regarding claims 11-13, Ko discloses an organic electronic device wherein the first electrode layer comprises a metal selected from a transition metal and an elemental metal (34, Column 3, lines 25-29; 52, Column 4, lines 25-35), wherein the metal is selected from a group consisting of Au, Cr, Si and Ta (52, Column 4, lines 25-35), and wherein the first electrode layer further comprises a oxide of the metal (34, Column 3, lines 25-29).

Regarding claims 19 and 20, Ko discloses an organic electronic device wherein the electronic device is a light-emitting display.

Response to Arguments

Applicant's arguments filed June 26, 2009 have been fully considered but they are not persuasive.

Rejection of claims 1, 5, 6, 10-13, 19 and 20 under 35 U.S.C. 112, first paragraph.

Applicant contends that the specification starting at Page 8, line 21 through page 13, line 20, teach the relationship between d_1 , d_2 , and the claimed $L_{\text{background}}$ percentage, in view of the Ambient Contrast Ratio (ACR) accepted term with set-up and procedures described by the "Flat Panel Display Measurements Standard" as set forth by the Video Electronics Standards

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Association Display Metrology Committee. Applicant's contention is not found persuasive, the Ambient Contrast Ratio (ACR) as stated in the specification is a measurement of ratios of luminances, i.e., L_{on} , L_{off} and $L_{background}$, and does not set forth a relationship between the claimed thicknesses and the claimed percentage of $L_{background}$. Although, applicant states at Page 13, lines 8-15, "A computer program using the equations and simplifying assumptions may be run to determine how the $L_{background}$ is affected by the thickness of any one or more layers or the composition of the layers. $L_{background}$ can be the sum of radiation 1121-1125. Note that radiation 1121-1125 may have different intensities and different phases. By changing the thickness(es) and composition(s) of the layer(s), the intensities and phases can be changed to cause destructive interference to reduce $L_{background}$.", the specification does not set forth a reasonable correlation between the claimed determination of thicknesses and the $L_{background}$, as to enable one skilled in the art how to make and/or use the full scope of the claimed invention.

Rejection of claims 1, 5, 6, 10-13, 19 and 20 under 35 U.S.C. 103(a) as being unpatentable over Ko (US 6,876,018).

Applicant contends that prior art reference to Ko fails to teach a precise, predictable determination of thickness values, or ranges of values, for at least one of the first electrode, the second electrode, the hole-transport layer, the electron-transport layer and the organic active layer as claimed in the instant application. Moreover, applicant contends that Ko requires deposition of a metal reflective layer on a substrate, which is not required within the disclosed and/or claimed invention. Applicant's arguments are not found persuasive.

Ko exemplifies, at Column 2, lines 39-46, "In the second embodiment of the present invention, different from the first embodiment, the metal anode is directly deposited on the substrate instead of depositing the metal reflective layer and the transparent anode thereon. By

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adjusting the thickness of the organic layer that the reflected lights generate destructive optical interference and improve the visually perceived contrast of the emitted light.”, accordingly, applicant’s arguments that Ko incorporates a metal reflective layer not claimed in the instant invention is not found persuasive since the metal reflective layer is not been used (see Fig. 6), and optimization of the organic layer accounts for the values of $L_{\text{background}}$. Moreover, the claimed language does not exclude the inclusion of a metal reflective layer from prior art devices.

Furthermore, Ko exemplifies the adjustment (i.e., the optimization) of the thickness the organic active layer and/or electrodes within the device in order to achieve a desired reduced ambient-light reflection, thus providing for a low $L_{\text{background}}$ (Column 2, lines 28-38). Accordingly, it is considered within the capabilities of one skilled in the art to optimize prior art conditions (i.e., the corresponding layers thicknesses within the display panel) in order to obtain a result-effective value (i.e., a $L_{\text{background}}$ within the claimed values) as an obvious matter of design engineering in view of Ko’s teachings.

Conclusion

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Mariceli Santiago/

Primary Examiner, Art Unit 2879